

RECEIVED  
CENTRAL FAX CENTER

JAN 21 2009

Dr. Liqing Liu  
10 Evergreen Common, SW  
Calgary, AB, T2Y 4N8  
CANADA  
Work Phone: (403) 644 3901  
Email: [liqing.liu@gmail.com](mailto:liqing.liu@gmail.com)  
Jan. 19, 2009

ATTN: Mr. David Parsley  
Examiner  
U.S. Patent and Trademark Office  
P. O. Box 1450  
Alexandria, Virginia 22313-1450  
Phone: (571) 272 6890  
Fax: (571) 273 8300

**RE: US 2007/0056462 A1 Not Patentable – More Issued Patents and Comments on Amended Claims**

Dear Mr. David Parsley:

Further to my letters of protest dated December 11, 2008 and Jan. 12, 2009 against the patentability of the named application, I would like to submit to you more new facts against its patentability.

Two issued US patents 7,278,354 B1 (Langan et al) and 7,278,353 B2 (Langan et al) have detailed disclosures of the use of intermetallics as shaped charge liner material. The priority date of the two patents is at least a few months earlier than the application in question.

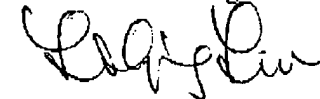
The named application has nothing invented at all.

Also please note the applicant is still trying to hide a basic fact that the shaped charge of their application has to be used in water. Their amended claims rely on the use of water and molten aluminum/water reaction, which have been fully disclosed by US 7,393,423 B2 (Liu).

To meet the protest requirements by USPTO, please send a copy of this document to the applicant of the named application.

Should you need other information, please do not hesitate to contact me.

Thanks and best regards.



Liqing Liu  
(Inventor and stakeholder of USP 7,393,423)

Page 1 of 4

JAN 21 2009

JAN-19-2009 13:09

From: 403 644 3906

Page: 2/4

**Patent Application: US 2007/0056462 A1 Not Patentable  
More Issued Patents and Comments on Amended Claims**

An Observation Prepared for USPTO  
Prepared and Submitted by:  
Dr. Liqing Liu  
10 Evergreen Common, SW  
Calgary, AB, T2Y 4N8 CANADA  
Work Phone: (403) 644 3901  
Email: liqing.liu@gmail.com

---

**Biblio. Data of the Application in Question**

(10) Pub. No.: US 2007/0056462 A1  
(43) Pub. Date: Mar. 15, 2007  
(54) OIL WELL PERFORATORS  
(21) Appl. No. 10/574,999  
(22) PCT Filed: Oct. 8, 2004  
(30) Foreign Application Priority Data  
Oct. 10, 2003 (GB).....0323717.9 (not valid, abandoned before publication)  
(73) Qinetiq Limited

**Biblio. Data of Issued US Patent 7,278,354**

(10) Patent No.: US 7,278,354 B1  
(45) Date of Patent: Oct. 9, 2007  
(54) SHOCK INITIATION DEVICES INCLUDING REACTIVE MULTILAYER STRUCTURES  
(21) Appl. No.: 10/855,298  
(22) Filed: May 27, 2004  
(63) Continuation-in-part of application No. 10/839,638 filed on May 5, 2004  
(60) Provisional application No. 60/473,509, filed on May 27, 2003

**Biblio. Data of Issued US Patent 7,278,353**

(10) Patent No.: US 7,278,353 B2  
(45) Date of Patent: Oct. 9, 2007  
(54) REACTIVE SHAPED CHARGES AND THERMAL SPRAY METHODS OF MAKING SAME  
(21) Appl. No.: 10/839,638  
(22) Filed: May 5, 2004  
(65) Prior Publication Data: US 2005/0011395 A1, Jan. 20, 2005  
(60) Related U.S. Application Data: Provisional application No. 60/478,761, file on Jun. 16, 2003,  
provisional application No. 60/473,509, filed on May 27, 2003

### Two Prior Art US Patents

The application in question claims the use of intermetallics as shaped charge (perforator) liner material, but this is not new at all. It has been disclosed and patented by Langan et al. in two US patents, by numbers 7,278,354 B1 and 7,278,353 B2, respectively. In their patents, they use two reactive metals such as Nickel (Ni) and Aluminum (Al) as liner material, which undergoes exothermic self-propagating reaction once initiated by shock. In their inventions, liners are made in multilayers, a technology having certain advantages over the traditional method, which is to make a liner by compacting a mixture of metal powders. So the application in question has nothing invented. An excerpt of the patent is shown below.

The shock initiation devices include reactive multilayer 20 structures comprising at least two layers of reactive components. As used herein, the term "reactive components" means materials that exothermically react with each other upon shock initiation and which produce a sufficiently high heat of reaction. Elevated temperatures of at least 1,000° C. 25 are typically achieved, for example, at least 2,000° C. In one embodiment, the reactive components may comprise elements that exothermically react to form intermetallics or ceramics. In this case, the first reactive component may comprise, for example, Ti, Ni, Ta, Nb, Mo, Hf, W, V, U 30 and/or Si, while the second reactive component may comprise Al, Mg, Ni, C and/or B. Typical materials formed by the reaction of such reactive components include  $TiAl_x$  (e.g.,  $TiAl$ ,  $TiAl_3$ ,  $Ti_3Al$ ),  $NiAl$ ,  $TaAl_3$ ,  $NbAl_x$ ,  $SiAl$ ,  $TiC$ ,  $TiB_2$ ,  $VC$ ,  $WC$  and  $VAI$ . Thermite powders may also be suitable. 35

An Excerpt from US  
7, 278,354 B1,  
Column 3, Lines 20-35

Please note that both patents have a priority date of May 27, 2003. This is at least a few months earlier than the priority date claimed by the application in question (Oct. 10, 2003), which in fact is not valid, because that application in the UK was abandoned before publication.

In this same patent, more information regarding the use of reactive metals as liner material is listed in a table. See another excerpt (Column 3, lines 20-35).

Another patent 7,278,353 B2 has similar disclosures regarding reactive metals as shaped charge liner material.

A partial list of candidate reactive layer materials is shown in Table 1.

TABLE 1

	Alloy Components	Heat of Reaction	Fluence	Peak Reaction Temperature
10	2Si + V	700 cal/g	2400 cal/cm <sup>3</sup>	3341 K
	3Si + 5Ti	428 cal/g	1590 cal/cm <sup>3</sup>	2548 K
15	5Nb + 3Si	222 cal/g	1390 cal/cm <sup>3</sup>	2518 K
	Al + Ni	330 cal/g	1710 cal/cm <sup>3</sup>	2362 K
	Al + Co	307 cal/g	1590 cal/cm <sup>3</sup>	2195 K
	2Si + Zr	258 cal/g	1040 cal/cm <sup>3</sup>	1988 K
	2Al + Zr	267 cal/g	1130 cal/cm <sup>3</sup>	1923 K
	2Si + Ti	308 cal/g	967 cal/cm <sup>3</sup>	1913 K
20	Mo + 2Si	187 cal/g	855 cal/cm <sup>3</sup>	1854 K
	Ni + Si	235 cal/g	1140 cal/cm <sup>3</sup>	1838 K
	2Si + Ta	120 cal/g	851 cal/cm <sup>3</sup>	1781 K
	5Al + 2Co	277 cal/g	1110 cal/cm <sup>3</sup>	1755 K
	Co + Si	299 cal/g	1450 cal/cm <sup>3</sup>	1733 K
	5Cr + 3Si	226 cal/g	847 cal/cm <sup>3</sup>	1671 K
25	2Al + Ti	314 cal/g	1100 cal/cm <sup>3</sup>	1643 K
	Al + Ti	240 cal/g	872 cal/cm <sup>3</sup>	1597 K
	3Al + Fe	278 cal/g	1020 cal/cm <sup>3</sup>	1407 K

Another Excerpt from  
US 7, 278,354 B1,  
Column 4, Lines 5-27

#### Comments on Amended Claims

It is noticed that the applicant submitted amended claims to USPTO on Jan. 16, 2009. The applicant is still trying to hide the fact that the shaped charge of its application has to be used in water. Their new claims have nothing new at all. Two of the independent new claims 34, and 39 all rely on the use of water and molten aluminum/water reaction, which has been fully disclosed by USP 7, 393, 423 (Liu). Due to the existence of other issued US patents 5,212,343 (Brupbacher et al), 7,278,354 B1 (Langan et al) and 7,278,353 B2 (Langan et al) introduced above, the application has nothing invented and it does not worth further comments on its claims.

--- END OF DOCUMENT ---